

# Annual Index-Volume 53

LIST OF ISSUES IN VOLUME 53, January 1975 to December 1975

No. 1	January	Pages
" 2	February	115-146
" 3	March	147-178
" 4	April	179-214
" 5	May	215-254
" 6	June	255-286
" 7	July/August	287-314
" 8	September	315-350
" 9	October	351-386
" 10	November	387-418
" 11	December	419-454

## A

AAGM REPORT 103  
ABS PLASTIC, RECYCLING 427-429  
ACCELERATORS, ION IMPLANTATION 388-394  
ACD (Automatic Call Distributor), No. 2B 180-187  
ACD (Automatic Call Distributor), No. 5 197-202  
ACHIEVEMENTS, NOTABLE 110-111  
ACOUSTIC TORPEDO 100, 102-103  
ALL NUMBER CALLING (ANC) 10  
*Alpha and Omega of the Network: Customer Products*,  
J. W. Schaefer 16-29  
ALTERNATE ROUTING 7-15  
AMERICAN SOCIETY FOR QUALITY CONTROL 89  
*Analytical Tools Simplify Telephone Company  
Operations*, Warren A. Cornell 116-128  
Armstrong, Col. E. H. 89  
Armstrong, Douglas B., *Testing PBX Circuit Packs*  
307-311  
Arnold, H. D. 65  
Arnold, Thomas F., *Minimizing Downtime for Electronic  
Switching Systems* 157-161  
Auston, D. H. 144-145  
AUTOMATIC CALL DISTRIBUTOR, No. 2B 180-187  
AUTOMATIC CALL DISTRIBUTOR, No. 5 197-202  
Automatic Intercept System (AIS) Grows 385  
AUTOMATIC MESSAGE ACCOUNTING (AMA) 10, 37  
AUTOMATIC NUMBER IDENTIFICATION (ANI) 35  
AUTOMATIC TESTING, PBX CIRCUIT PACKS 307-311

## B

Baker, W. O. 63  
Ballman, A. A. 66, 67  
BANKING BY TELEPHONE 876-883  
Bardeen, John 72, 73  
BATTLE ANNOUNCING SYSTEMS 98  
Behmer, Larry, *Serving Hotels, Motels, and Hospitals  
and the People They Serve* 272-277

Bell, Alexander Graham 83  
BELL SYSTEM CENTER FOR TECHNICAL EDUCATION  
189, 327  
Bennett, W. R. 89  
*Better Glass Fibers for Optical Transmission*, Merle D.  
Rigterink 340-345  
Biggs, B. S. 64  
Bishop, J. Daniel, *DC-to-DC Converters* 438-442  
Biskeborn, M. C. 63, 64  
Black, Harold S. 84-86  
Bobbeck, Andrew H. 69, 172  
Bode, Hendrik W. 85-86  
Bogdanowicz, Carol M. 207  
Boothby, O. L. 65  
Borison, V. Scott, *TRANSACTION™ Telephone Gets  
the Facts at the Point of Sale* 376-383  
Bowen, E. G. 101  
Boyle, Willard S., *Device Development* 70-81  
Bozorth, R. M. 65  
Brattain, Walter 72, 73  
BRIDGE, IMPEDANCE-MEASURING 226-233  
Brown, Walter L., *Ion Implantation* 388-394  
Buehler, E. 67  
Burton, J. A. 67  
Bush, Vannevar 101  
Buus, Robert G., *T-Carrier Administration System  
Speeds Service Restoration* 216-225

## C

CABLES, LIGHTGUIDE 444  
CAMA FEATURES FOR NO. 1 ESS 395-399  
Campbell, George A. 84-89  
CAPITAL PLANNING 120-121  
CAROT II TRIAL 282  
Carson, John R. 84-89  
CCD (Charge-Coupled Device) USED FOR IMAGING  
162-169  
CDA (Customer Demand Analysis) 123

CENTRALIZED ATTENDANT SERVICE 247, 249  
 CENTRALIZED AUTOMATIC MESSAGE ACCOUNTING 395-399  
 CENTRALIZED AUTOMATIC REPORTING ON TRUNKS 15  
 CENTRALIZED INVENTORY MANAGEMENT SYSTEM 122  
 CENTRALIZED TESTING AND MAINTENANCE 46, 48, 49  
 CENTREX 21  
 CHANNEL SERVICE UNIT 425  
 CHECK VERIFICATION BY TELEPHONE 376-383  
 Chin, G. Y. 65  
*Chynoweth, Alan G., Conserving Materials in the Bell System* 430-437  
 CICS (C Stock Information Control System) 122  
 CIRCUIT DESIGN SYSTEM 188-196  
 CIRCUIT PACK TESTING (PBX) 307-311  
 CIRCUIT PROVISION OPERATIONS 370  
 Clarke, W. J. 63  
 CMG-3 CODER-DECODER 408  
 COAXIAL CABLE 55-59  
 COMBINED LINE AND RECORDING (CLR) 6  
 COM KEY™ SYSTEMS 24  
 COMPETITION 128  
 COMPUTER-OPERATED Z/Y BRIDGE (COZY) 226-233  
 COMPUTER PROGRAMS FOR TESTING PBX CIRCUIT PACKS 307-311  
*Computers and Computer-Based Systems*, Victor A. Vyssotsky 90-95  
 COMPUTING TECHNOLOGY, BELL LABS' CONTRIBUTIONS TO 95  
 CONSERVATION OF RESOURCES 69  
*Conserving Materials in the Bell System*, Alan G. Chynoweth 430-437  
 COPSS (Central Office Planning System) 121  
 Cornell, Warren A., *Analytical Tools Simplify Telephone Company Operations* 116-128  
 COSMIC SYSTEM 366  
*COZY: Accurate Automatic Measurements of Components*, Lowell D. White 226-233  
 CREDIT AUTHORIZATION BY TELEPHONE 376-383  
 CREDIT CARDS 376-383  
 CROSSBAR, NO. 4A TOLL 9-10, 409-415  
 CROSSBAR SWITCHING 30-39  
 CRS (Centralized Results System) 126  
 CRYSTALS, SYNTHETIC 65  
 CUSTOMER PRODUCTS 16-29  
 CUSTOMER SWITCHING SYSTEM, THE DIMENSION™ PBX 316-323  
 CVD PROCESS FOR GLASS FIBERS 340-345

## D

Danielson, Warren E., *Exchange Area and Local Loop Transmission* 40-49  
 Darlington, Sydney 85  
 DATA COLLECTION AND ANALYSIS, PBC SYSTEM 409-415  
 DATA COMMUNICATIONS 420-426  
 DATA MANAGEMENT SYSTEM, PACKAGED 124-125  
 DATA-PHONE® SERVICE 25  
 DATA-PHONE® DIGITAL SERVICE 420-426  
 DATA SERVICE UNIT 425  
 DATA SETS 24-25  
 DATA UNDER VOICE 424  
 DATA-VOICE MULTIPLEXER 136-142  
 Davisson, C. J. 72, 73  
 DCES (Discretionary Capital Expenditure System) 121  
*DC-to-DC Converters*, J. Daniel Bishop and Robert J. Healey 438-442  
 DDS (Digital Data System) 420-426  
 Dearborn, E. F. 69  
 DeCoste, J. B. 63  
 De Loach, Bernard C., Jr. 74, 76  
*De Loach, Bernard C., Jr., On the Way: Lasers for Telecommunications* 203-210  
 Derrick, Link 79  
*Design Details of New Lead-Poison Tester Offered to Manufacturers* 285

DESIGN DEVELOPMENT LABORATORY 80  
*DESIGN LINE™ Decorative Telephones: Just the Beginning*, Norris R. Hall 234-241  
 DESK SETS 18, 27  
*Device Development*, Willard S. Boyle 70-81  
 DEW LINE 106  
 Dietzold, R. L. 85  
 DIGITAL CARRIER SYSTEM, T1C 256-263  
*Digital Data System Launches a New Era in Data Communications*, The, Clarence R. Moster and Leonard R. Pamm 420-426  
 DIGITAL ELECTRONICS 79  
 DIGITAL HIERARCHY 43  
 DIGITAL TRANSMISSION SYSTEM, T4M 352-359  
 DIMENSION™ CUSTOMER SWITCHING SYSTEM 19, 21  
*DIMENSION™ PBX: A New All-Electronic Customer Switching System*, The, Allan M. Gerrich, Roy V. Lohmiller, and George E. Saltus 316-323  
 DIRECTORY ASSISTANCE, ACD FOR 197-202  
 DIRECT DISTANCE DIALING 7-15  
 DIRECTORY SERVICES 118-119  
 DISTORTION IN HIGH-FREQUENCY AMPLIFIERS 295-299  
 DOPING PROFILE, MEASUREMENT OF 129-135  
 DSAP (Directory Scope Analysis Program) 118-119

## E

EADAS (Engineering and Administrative Data Acquisition System) 12, 282  
 Ebbinghaus, Hermann 150  
 ECHO CONTROL 15  
 ECHO SUPPRESSORS 328  
 ECONOMETRIC STUDIES 128  
 ECONOMIC THEORY 126, 128  
 800A/801A PBX MAINTENANCE 300-306  
 812A PBX 20-21, 326-327  
 ELECTRIC WAVE FILTER 84  
 ELECTRICAL RESEARCH PRODUCTS, INC. 22-23  
 ELECTROMAGNETIC FIELD, THEORY OF 83  
 ELECTRONIC SWITCHING SYSTEM (ESS) 30-39, 329  
 ELECTRONIC SWITCHING SYSTEMS, MINIMIZING DOWN-TIME 157-161  
 ELECTRONIC TECHNOLOGY, RECENT USE OF 361-363  
 ELECTRONIC TRANSLATOR SYSTEM (ETS) 10, 409-415  
 ELECTRONS, DYNAMICS OF 76  
 Elmen, G. W. 65  
 EMERGENCY RECOVERY DISPLAY (ERD) 159-160  
 ENGINEERING AND ADMINISTRATIVE DATA ACQUISITION SYSTEM (EADAS) 12, 282  
 ENGINEERING RESEARCH CENTER 326  
 ENVIRONMENTAL FACTORS 69  
 ERPI 22-23  
 ESS (Electronic Switching System)  
 No. 1 331, 332, 362-364, 395-399  
 No. 2 331, 362-364  
 No. 3 331, 362-364  
 No. 4 328, 330-331  
*Exchange Area and Local Loop Transmission*, Warren E. Danielson 40-49  
 EXCHANGE AREA, NEW PRODUCTS FOR 360-367  
*Experimental Page Facsimile System*, An, Hugh A. Watson 162-169  
*Experimental System Brings Lightwave Communications Closer* 444  
*Exploring the Speed of Mental Processes*, Max V. Mathews, David E. Meyer, and Saul Sternberg 148-156

## F

FACTORS SUPPORTING INVENTION 170-172  
*Faculty for Invention, A* (staff article by A. M. Bobotis) 170-174

*Faulty Trunks: A New Look at an Old Problem*,  
Edwin J. Messerli 278-283  
FEEDBACK AMPLIFIER, INVENTION OF 54  
FEEDBACK PROFILING METHOD 129-135  
Feher, George 73, 77  
FERRORESONANT REGULATED DC-TO-DC CONVERTERS  
438-442  
FEXT (Far-End Crosstalk) 258-259  
FIBERS, OPTICAL 203-206, 340-345, 444  
FIELD ENGINEERING FORCE 100  
50TH ANNIVERSARY OF THE RECORD 346-347  
Fisk, James B. 101  
*Flat-Screen Video* 175  
Fletcher, Harvey 88  
Fletcher, R. C. 77  
FORECASTING 123, 125  
Foster, R. M. 85  
Frank, Amalie J. 173  
Friis, Harald 101  
Frosch, Carl 79  
Fuller, C. S. 67

## G

GALLIUM ARSENIDE LASERS 203-210, 349  
Galt, J. K. 77  
Garraty, William C., *Introducing CAMA Features to No. 1 ESS* 395-399  
GENERAL TOLL SWITCHING PLAN, 1930 6-7  
Germer, L. H. 72, 73  
Gerrish, Allan M., *The DIMENSION™ PBX: A New All-Electronic Customer Switching System* 316-323  
Gillette, Dean, *Innovation in the Exchange Area* 360-367  
GLASS FIBERS 203-206, 340-345  
Gould, H. L. B. 65  
Graczyk, James F., *T1C Carrier: The T1 Doubler* 256-263  
GRAND FORKS PAR SITE 104  
GROWTH OF THE BELL SYSTEM 6-8, 15  
*G36 Handset: Good News for Serving Far-out Customers* 288-294  
GUIDANCE SYSTEMS 103-107

## H

Hall, Norris R., *DESIGN LINE™ Decorative Telephones: Just the Beginning* 234-241  
Hancock, Harvey G., *Recycling Turns Scrap Phones into New Plastic Products* 427-429  
HANDSET FOR RURAL SERVICE 288-294  
HANDSET, TWO-PIECE PLASTIC 240  
Hannay, N. B. 67  
Hardiman, Jerry 68  
Hartley, Ralph V. L. 88-89  
Hartman, Robert L. 207  
Hawkins, W. L. 62, 64  
Hawley, George T., *G36 Handset: Good News for Serving Far-out Customers* 288-294  
Haynes, J. R. 77  
Healey, Robert J., *DC-to-DC Converters* 438-442  
Heaviside, Oliver 83-84  
HEMATOFLUOROMETER 285  
Higgins, W. H. C. 107  
*Highlights of Bell Labs' Contributions to Early Radio* 108  
Hoffman, Maurice A., *New Features for the 770A PBX* 242-250  
Holden, A. N. 66  
Hopfield, J. J. 77  
Hopkins, I. L. 63

Horn, F. H. 63  
HOSPITAL TELEPHONE SERVICE 272-277  
HOTEL/MOTEL TELEPHONE SERVICE 272-277  
Howard, J. B. 63, 64  
Hubbauer, Philip 68  
Hubbauer, Philip, *Recycling Turns Scrap Phones into New Plastic Products* 427-429  
Humphries, Wylie B., *Simplifying the Design of Special Service Circuits* 188-196

## I

ICBM 104-105  
ICUR (Individual Circuit Usage Recording) 282  
IFAMS (Integrated Force Administration System) 118  
IMPATT DEVICES 75-76  
*In Defense of the Nation*, Clifford A. Warren 96-107  
INFORMATION THEORY 87-89  
*Innovation in Communications Technology*, Kenneth G. McKay 324-332  
*Innovation in the Exchange Area*, Dean Gillette 360-367  
INQUIRIES, ACD FOR 180-187  
INTEGRATED CIRCUITS, ION BEAM MILLED 252  
INTEGRATED CIRCUITS, ION IMPLANTED 392-393  
INTEGRATED ELECTRONICS 78  
*Integrated Optical Circuits: Another Step Forward* 349  
*Introducing CAMA Features to No. 1 ESS*, William C. Garraty 395-399  
INVENTION 170-174  
INVENTIVE MIND 172-173  
INVENTORIES 121-124  
INVENTORS DAY 170-174  
ION BEAMS 252  
*Ion Implantation*, Walter L. Brown and Alfred U. Mac Rae 388-394  
ISX (Interactive Executive System) 124

## J

Jackson, Allen, *Serving Hotels, Motels, and Hospitals and the People They Serve* 272-277  
Jewett, F. B. 62, 101  
Joel, Amos E., *Switching* 30-39  
Johnson, J. B. 74, 89  
Johnson, L. F. 67  
JOHNSON NOISE 74  
Johnston, Ralph L. 74, 76

## K

Kahn, Robert W., *Redesigned ACD Improves Directory-Assistance Service* 197-202  
*Keeping No. 4 Crossbar Young and Responsive*, Ronald C. Snare 409-415  
Keith, H. D. 63  
Kelly, M. J. 72  
Kemp, A. R. 62  
KEY TELEPHONE SYSTEMS 21, 23-24  
"KILLER" TRUNKS 278-283  
King, J. C. 66, 67  
Klaproth, Frederick F., *Simplifying the Design of Special Service Circuits* 188-196  
Kohman, G. T. 62, 67  
Kolb, E. D. 67  
Kompfner, Rudolph 85  
Kopp, William J., *Simplifying the Design of Special Service Circuits* 188-196  
KTS 21, 23-24  
KWAJALEIN ISLAND 102, 103

**L**

Lanza, V. L. 64  
**LASER MACHINING OF A TRANSMITTED IMAGE** 162-169  
**LASER MATERIALS** 67  
**LASER OPTICS** 144-145  
**LASERS** 349, 444  
 Lashley, Karl 150  
 Laudise, R. A. 66, 67  
**LEAD-POISON TESTER** 285  
**LEDs** 444  
**L5, DISTORTION IN** 295-299  
 Li, Tyng, *Optical Transmission Research Moves Ahead* 333  
**LIGHTWAVE TRANSMISSION** 444  
**LINEAR MICROPHONE FOR G36 HANDSET** 291-292  
 Little, J. B. 67  
**LMX-3 MULTIPLEX, INDUCTORS FOR** 226-233  
 Logan, Ralph A. 349  
 Lohmiller, Roy V., *The DIMENSION™ PBX: A New All-Electronic Customer Switching System* 316-323  
**LONG ROUTE DESIGN SYSTEM** 289-290  
*Looking Inside Semiconductor Devices*, G. L. Miller and D. A. H. Robinson 129-135  
**LOOP MAINTENANCE OPERATING SYSTEM** 93, 94  
**LOOPS, RESISTANCE ZONES FOR** 288-294  
 Lovell, C. A. 102  
 Lowry, H. H. 62

**M**

**MAAP (Maintenance and Administration Panel) FOR DIMENSION™ PBX** 319, 321-323  
 Mackey, Edward T., *Mixing Data and Voice on the T1 Line* 136-142  
 Mac Rae, Alfred U., *Ion Implantation* 388-394  
 Macurdy, William B., *The Network: Forging Nationwide Telephone Links* 4-15  
**MAGNETIC ALLOYS** 64  
**MAGNETIC BUBBLE DEVICES, ION IMPLANTED** 393-394  
**MAGNETIC BUBBLE MATERIALS** 69  
 Mahajan, S. 65  
**MAINTENANCE, NEW PROCEDURES AND FACILITIES FOR ELECTRONIC SWITCHING SYSTEMS** 157-161  
*Making Integrated Circuits with Ion Beams* 252  
 Malm, F. S. 63  
*Materials, W. P. Slichter* 60-69  
**MATERIALS CONSERVATION** 430-437  
*Mathematical Models Help Cut Distortion in High-Frequency Amplifiers*, Sundaram Narayanan and Donald L. Scharfetter 295-299  
 Mathews, Max V., *Exploring the Speed of Mental Processes* 148-156  
 Matsuoaka, S. 63  
 Matthews, John G. 23  
 Maxwell, James Clerk 83  
 Mayback, Wesley J., *Mixing Data and Voice on the T1 Line* 136-142  
 Mayback, Wesley J., *T1C Carrier: The T1 Doubler* 256-263  
**MCASP (Multiple Constraint Alternative Selector Program)** 121  
 McKay, Kenneth G., *Innovation in Communications Technology* 324-332  
 McMillan, Brockway, *Theory and Principles: The Intellectual Framework* 82-89  
**MEASUREMENTS ON SEMICONDUCTORS** 129-135  
*Meeting Business Needs with the No. 2B ACD*, Charles E. Morse 180-187  
**MEMORY RESEARCH** 148-156  
 Messerli, Edwin J., *Faulty Trunks: A New Look at an Old Problem* 278-283  
**METAL-OXIDE-SEMICONDUCTOR, ION IMPLANTED** 392-393

**METROPOLITAN COMMUNICATIONS** 352-359  
 Meyer, David E., *Exploring the Speed of Mental Processes* 148-156  
**MICROWAVE MULTICAVITY MAGNETRON** 101  
**MICS (Maintenance Inventory Control System)** 122  
**MILITARY RESEARCH AND DEVELOPMENT** 96-107  
 Miller, G. L., *Looking Inside Semiconductor Devices* 129-135  
*Millimeter Waveguide Scores High in Field Test*, William D. Warters 400-408  
**MILLING WITH ION BEAMS** 252  
**MINICOMPUTER FOR T-CARRIER TROUBLE LOCATING** 216-225  
*Minimizing Downtime for Electronic Switching Systems*, Thomas F. Arnold and William B. Rohn 157-161  
*Mixing Data and Voice on the T1 Line*, Edward T. Mackey, Wesley J. Mayback, and Sigmund B. Pfeiffer 136-142  
**M9 ANTI AIRCRAFT GUN DIRECTOR** 100, 102  
**MOBILE TELEPHONE SERVICE** 28  
 Molina, E. C. 88-89  
**M1C DIGITAL MULTIPLEX** 256-263  
 Morgan, S. O. 62  
 Morse, Charles E., *Meeting Business Needs with the No. 2B ACD* 180-187  
 Morse, Samuel F. B. 88  
 Morton, J. A. 75  
**MORTON TRIODE** 75  
 Moster, Clarence R., *The Digital Data System Launches a New Era in Data Communications* 420-426  
**MOVIMS (Motor Vehicle Information Management System)** 120-121  
**MULTILOCATION SERVICES, NO. 1 ESS** 264-271  
**MULTIPLEX CARRIER TRANSMISSION** 53  
**MULTIPLEXER, DATA-VOICE** 136-142  
**MULTIPLEXERS, TIME DIVISION** 425-426  
**MUZAK** 23

**N**

Narayanan, Sundaram, *Mathematical Models Help Cut Distortion in High-Frequency Amplifiers* 295-299  
 Nassau, K. 67  
**NATIONAL DEFENSE RESEARCH COMMITTEE** 101  
**NATIONAL INVENTORS DAY** 170-174  
**NEGATIVE FEEDBACK** 84-85  
 Nesbitt, E. A. 64, 65  
*Network: Forging Nationwide Telephone Links, The*, William B. Macurdy and Alistair E. Ritchie 4-15  
**NETWORK HIERARCHY** 4-11  
**NETWORK, TELEPHONE, HISTORY OF** 4-15  
*New Breadboard Design Cuts Wiring and Testing Time* 213  
*New Devices Serve as Solar Cells and Photodetectors* 212-213  
*New Features for the 770A PBX*, Maurice A. Hoffman and Arthur P. Ryan 242-250  
*New Record in Switching Speed, A* 144  
**NEXT (Near-End Crosstalk)** 258-259  
 Nielsen, J. W. 69  
**NIKE SYSTEMS** 104-105  
**90A CPS (Customer Premises System)** 273-274, 277  
**NOISE, JOHNSON** 74  
**NOISE, THEORY OF** 84-89  
**NONLINEAR DISTORTION (Mathematical Models for)** 295-299  
**No. 1 ESS, CAMA FEATURES** 395-399  
**No. 1 ESS, MULTILOCATION SERVICE** 264-271  
**No. 1 ESS, SERVICES PROVIDED BY** 272-277  
**No. 4 CROSSBAR, PBC SYSTEM FOR** 409-415  
**No. 101 ESS** 20  
 Norton, E. L. 85  
**NUMBERING PLAN, UNIVERSAL** 7-10  
 Nyquist, Harry 85-89

**O**

OCAP (Operating Companies Assignment Program) 327  
 OFFICE CHANNEL UNIT 425  
 Ohl, R. S. 67  
 Olsen, K. M. 65  
 1A KEY TELEPHONE SYSTEMS 23  
 O'Neill, Eugene F., *Radio and Long-Haul Transmission* 50-59  
*On the Way: Lasers for Telecommunications*, Bernard C. De Loach, Jr. 203-210  
 OPERATOR SERVICES 118  
 OPTICAL CIRCUITS 349  
 OPTICAL FIBERS 49, 59, 203-206, 340-345  
 OPTICAL FIBERS, CARRIER SOURCES 334-336  
 OPTICAL FIBERS, LOSS 335  
 OPTICAL FIBERS, SIGNAL DISTORTION 335  
 OPTICAL TRANSMISSION 203-206, 349, 444  
 OPTICAL WAVEGUIDE, ION IMPLANTED 394  
 ORTHOPHONIC PHONOGRAPH 21  
 OTSS (Off-the-Shelf System) 125, 127  
 OXIDE MASKING 79-81

**P**

Padden, F. J. 63  
 Pamm, Leonard R., *The Digital Data System Launches a New Era in Data Communications* 420-426  
 PANEL SWITCHING 30-39  
 Parkinson, D. B. 102  
 PATENT PROCESS 171-172  
 PBC SYSTEM 409-415  
 PBX CIRCUIT PACK TESTING 307-311  
*PBX Maintenance Comes Wrapped in a New Package*, John D. Wiidakas 300-306  
 PBX (Private Branch Exchange), THE DIMENSION™ 316-323  
 PBXs 18-21  
 Penfield, Walter 150  
 PERC (Processor Emergency Recovery Circuit) 159-161  
 PERFORMANCE INDICES 125-126  
 PERIPHERAL BUS COMPUTER 409-415  
 PERMALLOYS 64-65  
 Pfann, W. G. 68, 76  
 Pfeiffer, Sigmund B., *Mixing Data and Voice on the T1 Line* 136-142  
 PHOTODETECTORS 212, 338  
 PICTUREPHONE® VISUAL TELEPHONE 25-26  
 Pierce, John R. 87  
 PLANT OPERATIONS 120-121  
 PLASTIC, RECYCLING 427-429  
 PLASTICS FOR OUTDOOR CABLE 62-64  
 PLUG-IN INVENTORY CONTROL SYSTEM (PICS) 93-94  
 POLYETHYLENE 63-64  
 POLYVINYL CHLORIDE (PVC) 427, 429  
 POPS (Program for Operator Scheduling) 118, 121  
 POWER FOR INTEGRATED CIRCUITS 438-442  
 PRICING THEORY 128  
 PROBFOR (Probability Forecasting) 123  
 PROFILING METHOD 129-135  
 PULSE CODE MODULATION (PCM) 45-46  
 PULSE WIDTH CONTROL (PWC) DC-to-DC CONVERTERS 438-442

**Q**

QUALITY CONTROL, STATISTICAL 89  
 QUALITY OF TRANSMISSION 9, 13-15  
 QUARTZ, SYNTHETIC 65-69  
 QUEUEING THEORY 89  
 QUICK-CONNECT WIRING 213

**R**

RADAR 99-102  
*Radio and Long-Haul Transmission*, Eugene F. O'Neill 50-59  
 RADIO, HIGHLIGHTS OF CONTRIBUTIONS 108-109  
 Radosevich, Roger A., *G36 Handset: Good News for Serving Far-out Customers* 288-294  
 REACTION TIME EXPERIMENTS ON HUMAN MEMORY 148-156  
 Read, W. T. 75  
 Rechtenbaugh, Donald L., *T-Carrier Administration System Speeds Service Restoration* 216-225  
 RECORD KEEPING, TRUNKS 368-375  
 RECYCLING METALS 434-435  
*Recycling Turns Scrap Phones into New Plastic Products*, Harvey C. Hancock and Philip Hubbauer 427-429  
*Redesigned ACD Improves Directory-Assistance Service*, Robert W. Kahn 197-202  
 REGULATORY CONSTRAINT 128  
 Reinhart, Franz K. 349  
 RELIABILITY, NEW CONCEPTS FOR ELECTRONIC SWITCHING SYSTEMS 157-161  
 Remeika, J. P. 69  
 REMENDUR 65  
 REPEATERS, OPTICAL 337  
 RESISTANCE ZONES FOR CUSTOMER LOOPS 288-294  
 Rice, S. O. 89  
 Richardson, Delton B., *Upgrading Multilocation Services With No. 1 ESS* 264-271  
 Rigerink, Merle D., *Better Glass Fibers for Optical Transmission* 340-345  
 Ritchie, Alistair E., *The Network: Forging Nationwide Telephone Links* 4-15  
 Robinson, D. A. H., *Looking Inside Semiconductor Devices* 129-135  
 Rohn, William B., *Minimizing Downtime for Electronic Switching Systems* 157-161  
 Rorty, M. C. 89  
 Rudd, D. W. 66, 67  
 RURAL AREAS, HANDSET FOR 288-294  
 Ryan, Arthur P., *New Features for the 770A PBX* 242-250

**S**

Sabia, R. 64  
 SAFEGUARD SYSTEM 102, 106  
 SATELLITE COMMUNICATIONS 58  
 Scaff, J. H. 67, 68  
 SCANNER FOR IMAGING, EXPERIMENTAL 162-169  
 Schaefer, J. W., *Alpha and Omega of the Network: Customer Products* 16-29  
 Scharfetter, Donald L., *Mathematical Models Help Cut Distortion in High-Frequency Amplifiers* 295-299  
 Schmidt, Paul 252  
 Scovil, H. E. D. 73, 77  
*Sea Plow IV Ready to Swim* 313  
 Seidel, Harold 73, 77, 171  
 SEMICONDUCTOR DEVICES, MEASUREMENTS OF 129-135  
 SEMICONDUCTOR SWITCH 144  
 SENTINEL SYSTEM 106  
 SERVING AREA CONCEPT (SAC) 46, 47  
*Serving Hotels, Motels, and Hospitals and the People They Serve*, Larry Behmer and Allen Jackson 272-277  
 770A PBX, NEW FEATURES FOR 242-250  
 SG SUBMARINE CABLE, DISTORTION IN 295-299  
 Shannon, Claude E. 74, 87-89, 150  
 Shewhart, Walter 89  
 Shockley, William 72, 73  
*Simplifying the Design of Special Service Circuits*, Wylie B. Humphries, Frederick F. Klapproth, and William J. Kopp 188-196

Sipress, Jack M., *T4M: New Superhighway for Metropolitan Communications* 352-359  
 Slichter, W. P. 67  
 Slichter, William P., *Materials* 60-69  
 SLIMS (Supply Line Inventory Management System) 122  
 SMALL TELEPHONE SYSTEM 24  
 Snare, Ronald C., *Keeping No. 4 Crossbar Young and Responsive* 409-415  
 SOLAR CELLS 212  
*Some Notable Achievements* 110-111  
 SOUND MOTION PICTURES 22-23  
 Southworth, George 53, 101, 401-402  
 Spencer, Edward 252  
 Sparks, M. 67  
 SPECIAL SERVICE CIRCUITS 188-196  
 Sperling, George 155  
 SPINODAL ALLOYS 435-436  
 STANDARD DESIGNS FOR SPECIAL SERVICE CIRCUITS 188-196  
 STANDARD WIRING PLANS 23  
 STATLIB (Statistical Computing Library) 117, 123-124  
 STEP-BY-STEP SWITCHING 30-39  
 Sternberg, Saul, *Exploring the Speed of Mental Processes* 148-156  
 STORED PROGRAM CONTROL (SPC) 37  
 STS 24  
 SUBMARINE CABLE 58  
 Sullivan, R. A.  
 SUPERMALLOY 65  
 SWIFT (System Workshops in Forecasting Techniques) 124  
*Switching*, Amos E. Joel 30-39  
 SWITCHING, A NEW RECORD IN SPEED 144  
 SYSTEM STATUS INDICATOR (PBX) 300-306

#### T

TAT-6 TRANSATLANTIC CABLE 313  
*T-Carrier Administration System Speeds Service Restoration*, Robert G. Buus, Donald L. Rechtenbaugh, and Richard B. Whipp 216-225  
 TCAS (T-Carrier Administration System) 216-225  
 Teal, G. K. 67  
 TELEPHONES, DECORATIVE 234-241  
*Testing PBX Circuit Packs*, Douglas B. Armstrong 307-311  
*T4M: New Superhighway for Metropolitan Communications*, Jack M. Sipress 352-359  
*Theory and Principles: The Intellectual Framework*, Brockway McMillan 82-89  
 THERMOPLASTICS, RECYCLING 429  
 Theuerer, H. C. 69  
 Thomas, D. G. 77  
 Timko, Joseph W., *TIRKS Takes the Paper Work Out of Trunk Record Keeping* 368-375  
 Tinus, W. C. 107  
*TIRKS Takes the Paper Work Out of Trunk Record Keeping*, Joseph W. Timko 368-375  
 TOLL TRANSMISSION 50-59  
 T1 CARRIER SYSTEM, CAPACITORS FOR 227-228  
 T1 TRANSMISSION SYSTEM 45, 46, 48, 330-331, 424  
 T1 TROUBLE LOCATING 216-225  
*T1C Carrier: The T1 Doubler*, James F. Graczyk, Edward T. Mackey, and Wesley J. Maybach 256-263  
 T1WB4 DATA-VOICE MULTIPLEXER 136-142  
 TOTS (Total Operating Traffic System) 118  
 TRAFFIC THEORY 89  
*TRANSACTION™ Telephone Gets the Facts at the Point of Sale*, V. Scott Borison 376-383  
 TRANSATLANTIC CABLE 313  
 TRANSISTOR ELECTRONICS, MILESTONES 74  
 TRANSISTOR INVENTION AND DEVELOPMENT 72, 78

TRANSLATION, DIGIT 9-10  
 TRANSMISSION QUALITY 40-49  
 TRCC (T-Carrier Restoration Control Center) 216-225  
 TRUNK PROBLEMS, DETECTING AND LOCATING 278-283  
 TRUNK RECORD KEEPING 368-375  
 TWX 24

#### U

*Upgrading Multilocation Services With No. 1 ESS*, Delton B. Richardson 264-271

#### V

VACUUM TUBE AMPLIFIER IN LONG-HAUL TRANSMISSION 52-53  
 VACUUM TUBES, EARLY 72  
 Van Uitert, L. G. 67, 69, 170  
 VIA NET LOSS (VNL) 15  
 VICALLOYS 65  
 VOICE-DATA MULTIPLEXER 136-142  
*Vyssotsky, Victor A., Computers and Computer-Based Systems* 90-95

#### W

Wahl, C. V. 65  
 Walker, A. C. 67  
 Wallder, V. T. 63  
 Warren, Clifford A., *In Defense of the Nation* 96-107  
 Warters, William D., *Millimeter Waveguide Scores High in Field Test* 400-408  
*Watson, Hugh A., An Experimental Page Facsimile System* 162-169  
 WAVEGUIDE, CIRCULAR MILLIMETER 400-408  
 WAVEGUIDE, DIELECTRIC-LINED 403-404  
 WAVEGUIDE, HELIX 403-404  
 WAVEGUIDE, OPTICAL 340-345  
 WAVE NATURE OF ELECTRONS 72  
 Wenny, D. H. 65  
 Wernick, J. H. 65  
 WHEATSTONE BRIDGE 230  
*Whipp, Richard B., T-Carrier Administration System Speeds Service Restoration* 216-225  
 White, A. H. 62, 67  
 White, J. H. 65  
*White, Lowell D., COZY: Accurate Automatic Measurements of Components* 226-233  
 WHITE SANDS MISSILE RANGE 104  
 Wiebusch, C. F. 63, 107  
*Wiidakas, John D., PBX Maintenance Comes Wrapped in a New Package* 300-306  
 Williams, R. R. 62  
 Winslow, F. H. 62, 64  
 WIRE-LINE TELEVISION 22  
 WIRING TECHNIQUE, EXPERIMENTAL 213  
 WT4 MILLIMETER WAVEGUIDE SYSTEM 400-408

#### Y

YELLOW PAGES, LAYING OUT 168  
*YRAP (Yellow Page Rate Base Analysis Plan)* 119

#### Z

Zobel, O. J. 84-87

